REMARKS

Claims 1, 4-7, 10-14, 16, 17, 20, 21, 23, 24 and 26 are pending, with claims 1, 7, 13, 17, 21 and 24 being independent. Claims 1, 7, 13, 21 and 24 have been amended. No new matter has been added. Reconsideration is respectfully requested in view of the amendments to the claims and the remarks below.

I. The § 103 Rejections

Claims 1-13, 15-21, 23-24 and 26 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over McEwen et al. (US 6,732,328) in view of Akiyama et al (US 7,080,313) and further in view of Abu-Rgheff et al. ("A Modified Viterbi Decoder based upon Cross Correlation for use in Bandwidth Efficient Systems", Digital Satellite Communications, 1995, Tenth International Conference, 15-19 May 1995, University of Plymouth, U.K.). Claim 14 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over McEwen and Akiyama as applied to claim 13, and further in view of Cideciyan et al. (US 6,377,635). Claims 22 and 25 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over McEwen and Akiyama as applied to claims 21 and 24, and further in view of Fisher et al (US 6,249,398). These contentions are respectfully traversed.

A. McEwen, Akiyama, AbuRgheff, and Fisher Fail To Disclose Viterbi Detection That Provides a Robust Tolerance of Phase Uncertainty With a Waveform of Widely Varying Amplitude and Provides Accurate Detection Decisions Even When The Amplitude of the Waveform Is Very Small

In the Advisory Action dated February 11, 2008, the Office states:

Applicants submit that the combination of McEwen, Akiyama, Abu -Rgeff and Fisher does not disclose of the Viterbi detection means providing robust tolerance of phase uncertainty with the widely varying amplitude waveform. Applicants submit that Fisher discloses of an error generator to provide input to timing control circuitry which in turns adjusts the sampling phase of the sampl er. Examiner submits that Fisher discloses that in order to properly equalize and detect the user -data bits, several parameters must be adaptively controlled error generator. The error generator compares the sample values at node 54 with the ideal target r esponse values (in accordance with the target polynomial) to provide an error signal to the timing control circuit which in turn adjusts the phase. It is clear that a Viterbi detection means through and error generator provides robust tolerance of phase un certainty with the widely varying amplitude waveform.

With reference to FIG. 2 of Fischer, while Fischer may disclose an error generator 64 that provides an input to timing control circuitry 70 to adjust a sampling phase of sampler 46, the components 64, 67, 70 and 46 are clearly separate from the Viterbi detector 60. *See* Fisher at FIG. 2. Thus, these components cannot be equated with the claimed subject matter, "the Viterbi detection provides robust tolerance of phase uncertainty" (emphasis added). Further, McEwen, Akiyama, Abu-Rgheff, and Fisher each fails to disclose Viterbi detection that provides a robust tolerance of phase uncertainty with the waveform of widely varying amplitude including providing accurate detection decisions even when the amplitude of the waveform is very small. Thus, for at least this reason, claims 1, 7, 21 and 24 (and the claims that depend therefrom) are allowable over the reference cited above.

B. McEwen, Akiyama, AbuRgheff, and Fisher Fail To Disclose a Partial Response Channel Having a Transfer Function Defined According to a Target Polynomial, $T(D) = p_0 + p_1 D + \cdots + p_M D^M$, and the Detection Operates According to a Trellis Having 2^M States, and All Survivor Paths Associated With All The 2^M States in the Trellis Merge in M Steps

In the Advisory Action dated February 11, 2008, the Office states:

Applicants submit that McEwen does not specifically teach how many steps are needed for all survivor paths to merge. Examiner submits that McEwen discloses of a t arget polynomial as discussed on the Final Rejection OA where L is the length (steps) and M is the number of states

McEwen states:

> The Viterbi algorithm is an iterative process of keeping track of the path with a smallest accumulated metric leading to each state of a detection trellis (graph). The metrics of all of the paths leading into a particular state are calculated and compared. Then, the path with the smallest metric is selected as the survivor path. In this manner all paths which can not be part of the minimum metric path through the trellis are systematically eliminated. The survivor path to each state is stored in a path memory. Given that the path memory is made sufficiently long, all of the survivor paths will diverge from a single path within the span of the path memory. The single path from which all of the current survivor paths diverge is the minimum metric path. The input sequence associated with this path appears at the output of the Viterbi detector.

See McEwen at page col. 1, line 63, to col. 2, line 10. Nothing in this portion of McEwen can be linked with the other cited portions of McEwen to teach that all the survivor paths merge in M steps, where M corresponds to the target polynomial, $T(D) = p_0 + p_1 D + \cdots + p_M D^M$. The cited portions of McEwen do not specify how many steps are needed for all survivor paths to merge. The term "L" that the Examiner refers to corresponds to a length the of the partial response channel 17 (*see* McEwen col. 7, lines 47-60), and not to the number of steps in which all survivor paths merge. Moreover, neither Akiyama nor Abu-Rgheff cure the noted deficiencies of McEwen.

For at least the above reasons, each of independent claims 1, 7, 13 and 17 should be in condition for allowance. Dependent claims 4-6, 10-12, 14, 16 and 20 should be allowable based on the above arguments and the additional recitations they contain. For example, claim 16

recites, "wherein the memory comprises a path memory of length M." The cited portion of McEwen merely states:

> The number of states in a Viterbi detector matched only to the channel is equal to $M=2^{L-1}$, where L is the length of the partial response, i.e. the span of non-zero terms.

See McEwen at col. 3, lines 13-15. The cited portion of McEwen does not specify the length of the path memory as suggested by the Office. In response, the Office now states, "Examiner submits that this is taught in the background of McEwan Patent for a conventional Viterbi algorithm (Col 2, Lines 1-10 and Col 3, Lines 13-24)." *See* 11-23-2007 Office Action at page 13. However, these portions of McEwan merely state:

> The survivor path to each state is stored in a path memory. Given that the path memory is made sufficiently long, all of the survivor paths will diverge from a single path within the span of the path memory. The single path from which all of the current survivor paths diverge is the minimum metric path. The input sequence associated with this path appears at the output of the Viterbi detector. [...] The number of states in a Viterbi detector matched only to the channel is equal to M=2.sup.L-1, where L is the length of the partial response, i.e. the span of non-zero terms. For a (1-D) dicode channel the number of Viterbi states is 2. For a (1-D)(1+D).sup.2 EPR4 channel, the number of states is 8. Channels that provide better performance at higher densities tend to have even more states. When a modulo-7 code is used on a channel with M states, the combined Viterbi detector has 7M states. As the number of states in the channel increases, the complexity of the combined detector increases seven-fold.

See McEwen at col. 2, lines 3-10, and col. 3, lines 13-24. Nothing in these newly cited portions of McEwan actually state that the path memory is of length M, where M corresponds to the

target polynomial, $T(D) = p_0 + p_1 D + \cdots + p_M D^M$. Thus, claim 16 should be allowable for at least this additional reason.

With respect to claim 14, Cideciyan fails to cure the noted deficiencies of McEwen. Thus, claim 14 should be allowable at least based on its dependence from claim 13.

CONCLUSION

The foregoing comments made with respect to the positions taken by the Examiner are not to be construed as acquiescence with other positions of the Examiner that have not been explicitly contested. Accordingly, the above arguments for patentability of a claim should not be construed as implying that there are not other valid reasons for patentability of that claim or other claims.

In view of the present response, all of the claims should be in condition for allowance. A formal notice of allowance is respectfully requested.

Please apply the RCE fee, the three month extension of time fee, and any other necessary charges or credits, to deposit account 06-1050.

Respectfully submitted,

Date: May 23, 2008

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